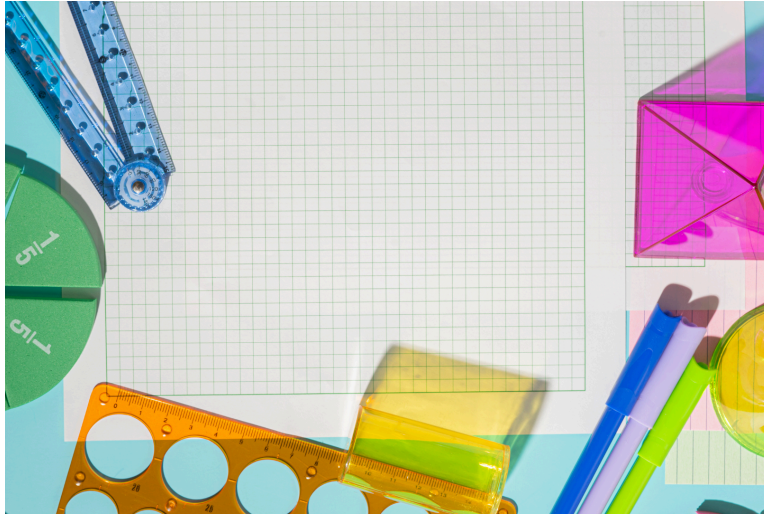


Recommended Mathematics Tools and Manipulatives

Secondary



This resource is a repository of mathematics tools and manipulatives for secondary math compiled by [Shannon Olson](#). For lists of tools aligned to other grade levels, please click [HERE](#).

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Middle School Physical Manipulatives

Item	Best Used For
Unifix Cubes	Support exploration of ratios and proportional reasoning.
Colored Chips or Two-Colored Counters	Model positive and negative integers and integer operations.
Cuisenaire Rods	Help students reason about number relationships, fractions, and proportional thinking.
Pattern Blocks and Fraction Tiles	Support fraction sense and connections among fractions, decimals, and ratios.
Geoboards and Coordinate Pegboards	Help students visualize area, perimeter, transformations, and graphing on the coordinate plane.
Transparent 3D Geometric Solids	Allow students to explore volume, surface area, and spatial relationships.
Algebra Tiles	Support understanding of expressions, equations, and integer operations by visually modeling algebraic relationships.

High School Physical Manipulatives

Item	Best Used For
Algebra Tiles	Visualizes the distributive property, factoring polynomials, and completing the square by representing variables and constants as area blocks.
Platonic Solid Models	Sturdy models for higher-level spatial reasoning and point group exploration
Conic Section Models	Cross-sectioned solids that demonstrate how a plane intersecting a cone creates a circle, ellipse, hyperbola, or parabola.
Cuisenaire Rods	While often for younger students, these are excellent in high school for modeling ratios, proportions, and the conceptual basis of radical simplifications.
XY Coordinate Pegboards	Enables plotting of points and lines with pegs and rubber bands, making it easier to visualize slope and intercepts without constant erasing.
Transparent 3D Geometric Solids	Allows students to see interior heights, diagonals, and cross-sections, bridging the gap between 2D formulas and 3D volume/surface area

Digital Manipulatives & Resources

Math Strand	Tool	Best Used For:
Graphing and Functions	Desmos	Visualizing linear, quadratic, and exponential functions; creating regressions; and interactive classroom activities (Marbleslides, Card Sorts).
Graphing and Functions	GeoGebra	Dynamic 2D/3D geometry, interactive calculus visualizations, and linking algebraic equations to geometric shapes.
Statistics and Data Visualization	CODAP	Common Online Data Analysis Platform. Drag-and-drop tool for exploring patterns in large datasets and statistical modeling.
Statistics and Data Visualization	Tuva Labs	Real-world data literacy and scientific/statistical graphing.
Geometry and Modeling	GeoGebra 3D Calculator	Visualizing volumes of rotation, cross-sections, and planes in 3D space.
Geometry and Modeling (9-12)	Desmos Geometry	Simplified compass-and-straightedge constructions and transformations.

Tools For Games

- [Virtual Number Cards \(0-9\)](#)
- [Virtual Dice](#)
- [Virtual Dice \(several # of side options\)](#)
- [Virtual Spinner \(3-9\)](#)
- [Virtual Spinner \(1-10\)](#)
- [Virtual Classroom Timer](#)
- [Virtual Stopwatch](#)